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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/630,037

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Ramachandra N. Pai

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EXAMINER

CHANKONG, DOHM

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/630,037	Applicant(s) PAI, RAMACHANDRA N.	
	Examiner DOHM CHANKONG	Art Unit 2452	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,7-9,12,14,15 and 18-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 7-9, 12, 14, 15, and 18-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This final rejection is in response to Applicant's amendment and arguments filed on 2/9/2010. Applicant amends claims 1, 2, 7, 8, 12, 15, 19, and 20, adds claims 21 and 22, and previously cancelled claims 3-6, 10, 11, 13, 16, and 17. Accordingly, claims 1, 2, 7-9, 12, 14, 15, and 18-22 are presented for further examination.

I. ALLOWABLE SUBJECT MATTER

Claims 19-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

II. RESPONSE TO ARGUMENTS

A. Applicant's amendment does not overcome the § 101 rejection of claim 1.

Applicant amends method claim 1 to recite that the method comprises a processor. This amendment does not overcome the § 101 rejection for at least two reasons. First, it is unclear how a method could comprise a structural element such as a processor. A method claim traditionally only comprises steps or functional language and not structural elements.

Second, the claim is still not properly tied to a machine in the manner outlined by the Board of Patent Appeals and Interferences in the informative opinion, *In re Bilski*. The particular machine tie must impose a meaningful limit on the claim's scope. The claim should therefore be amended so that the claimed process is meaningfully tied to a machine. One way of achieving this would be to amend the claimed steps so that they are all implemented by a machine.

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B. Applicant's amendment overcomes the § 112, first paragraph rejection of claims 1, 7, 12, 19, and 20.

Applicant amends claims 1, 7, and 12 to recite selecting a vertex with a least sum of connectivity counts from among all vertices with a same least connectivity count. This amendment overcomes the § 112, first paragraph rejection as set forth in the previous action. The rejection is therefore withdrawn.

C. Applicant's arguments with respect to the § 103 rejection of claims 7 and 12 are not persuasive because *Abello* discloses pruning vertices from a graph.

Applicant argues that *Abello* does not teach the claimed limitations because it is directed only to pruning edges and not vertices as required by the claim. Applicant's argument is not persuasive for the following reasons.

The effect of pruning edges from a graph is to prune the vertices. That is, if the edges connecting a vertex to other vertices in a graph are pruned, the vertex is effectively pruned. *Abello* elaborates further on page 607 describing the peel operation that deletes both edges and vertices from the graph based on their degree (i.e., connectivity count).

Specifically, *Abello* discloses that the peel operation "recursively deletes from G all vertices having degree less than q, along with their incident edges" [pg. 607, ¶ 2]. The purpose of this function is to "delete irrelevant vertices and edges" [pg. 607, ¶ 6].

Based on the foregoing, Applicant's arguments are not persuasive. The rejection of claims 7 and 12 as set forth in the previous action are therefore maintained.

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III. CLAIM REJECTIONS - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

A. Claim 1 is rejected under 35 U.S.C. §101 because the claimed invention is directed towards non-statutory subject matter.

Based on new guidance from the Board of Patent Appeals and Interferences in the informative opinion, *In re Bilski* (and pending review by the Federal circuit), this action contains a new §101 rejection of claims 1, 2, 5, and 18 because the claims are directed towards mental steps. In *Bilski*, the Board found that the absence of any apparatus in the appellants' method claim was evidence that the claims did not transform physical subject matter as a machine inherently would. It is the current position of the PTO that a §101 method or process must (1) be tied to another statutory class (such as an apparatus) or (2) transform underlying subject matter (such as an article or materials) to a different state or thing.

Adding "by the processor" to the updating step is not sufficient to tie the claimed process to a machine. The particular machine tie must impose a meaningful limit on the claim's scope. The claim should therefore be amended so that the claimed process is meaningfully tied to a machine. One way of achieving this would be amend all of the claimed steps so that they are all machine implemented.

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IV. CLAIM REJECTIONS – 35 U.S.C. § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

A. Claims 1 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is a method claim. The new limitation attempts to limit the method by reciting that the method comprises a processor. It is not clear how this would be possible. The previous action suggested amending the claims such that the method steps were implemented by (tied to) a machine. This approach would overcome the § 101 rejection.

Claim 7 is a system claim. Three of the claimed elements of claim 7 are confusing and do not seem to fit within a system. The limitations reciting "a placement," "a selection," and "a removal," are in contrast to the previous elements which are clearly hardware elements (e.g., a processor, a counter).

Applicant seems to be trying to claim method steps within the system claim. This is confusing and needs to be corrected by claiming appropriate elements of the claimed system.

Claim 7 is also rejected for reciting "a selection...of all its neighboring vertices from among all *vertex*." The tense of the italicized term is incorrect and needs to be changed to "vertices."

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V. CLAIM REJECTIONS - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

A. Claims 7-9, 12, 14, and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Abello* et al, “Massive Quasi-Clique Detection” (2002) [*Abello*], in view of *Natarajan* et al, U.S. Patent Publication No. 2004|0151121 [*Natarajan*].

All citations are to *Abello* unless otherwise noted.

Claims 7 and 12

As to claims 7 and 12, *Abello* as modified by *Natarajan* discloses a system and article for maximizing group membership [pg. 599: discussing the maximum clique problem] comprising:

a processor in communication with a memory containing information about vertices in a graph including a connectivity count [pg. 600, ¶ 3: discussing the graph and edge sets fitting in RAM];

the graph with at least two vertices;

a counter to calculate the connectivity count of each vertex in the graph [pg. 600: discussing vertices with degrees - the degrees read on the claimed connectivity count], wherein each vertex represents a single hardware component [*Natarajan*, 0002: nodes in a graph represent switches in a network], wherein the connectivity count of a vertex is a number of neighbors connected to the vertex [pg. 600: degrees of a vertex represent to how many other vertices the vertex is connected (edges)];

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a placement of each vertex in descending order of connectivity based upon said calculated connectivity count [pgs. 600: discussing placing vertices in order of their degrees starting from degree 1 and increasing to $k-1$ | pg. 601: pruning vertices “in increasing degree order”];

a selection of a vertex with a least sum of connectivity counts of all its neighboring vertices from among all vertices having a same least connectivity count [pgs. 600-601: the pruning process starts with a vertex of the lowest degree (starting from 1)];

a removal of said selected vertex from the graph [pgs. 600-601: pruning the vertex]; and

a clique of completely interconnected vertices, wherein each vertex in said grouping is connected to each other vertex in said grouping [pg. 600: the process returns a maximum clique | pg. 603: recursively selecting a vertex that will eventually terminate with a maximal set].

As indicated in the foregoing mapping, *Abello* does not expressly disclose that the nodes represent a hardware component. However, applying *Abello*'s maximal clique algorithm to computer elements was well known in the art at the time of Applicant's invention as evidenced by *Natarajan*. It would have been obvious to one of ordinary skill in the art to have modified *Abello*'s maximum clique algorithm to be applies to computer nodes as taught in *Natarajan*. *Natarajan* discloses that using a maximum clique algorithm such as one taught in *Abello* on a computer network is beneficial because it increases the efficiency of data transfer in the computer network [0002].

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Claims 8 and 14

As to claims 8 and 14, *Abello* as modified by *Natarajan* discloses updating said connectivity count for all remaining vertices in said graph following removal of a single vertex from said graph [pg. 601: “updating every time the degrees of both endpoints”].

Claims 9 and 15

As to claims 9 and 15, *Abello* as modified by *Natarajan* discloses wherein removal of a vertex from said graph with said connectivity count is continuous until the clique of completely interconnected vertices is formed [pg. 600: “recursively delete edges” | pg. 603: recursively selecting a vertex that will eventually terminate with a maximal set].

VI. CONCLUSION

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOHM CHANKONG whose telephone number is (571)272-3942. The examiner can normally be reached on Monday to Friday [10 am - 6 pm].

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thu Nguyen can be reached on (571)272-6967. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DOHM CHANKONG/
Primary Examiner, Art Unit 2452